2. INVENTORY OF SEGMENTAL PHONEMES

2.1 CONSONANTS

CONSONANTAL PHONEMES

	labial	alv.	alv.-pal.	velar	lab.-velar	glottal
vl. stops	p	t	tš	k	kp	
vd. stops	b	d	dž	g	gb	
vl. frics.	f	s				
vd. frics.	v	z				
liquid		l				
nasals	m	n	ɲ	ŋ	ŋm	
glides			y	w		h

/d/ is realized as [ř] intervocalically. The realization of /g/ freely varies between [g] and [ɣ] intervocalically. Any nasal consonant is homorganic with a following consonant. A nasal consonant becomes [ŋ] when followed by /w/; therefore /w/ is grouped with velars rather than labials. See section 5 for details.

2.2 VOWELS

VOCALIC PHONEMES

	front	central	back
high [+ATR]	i		u
high [-ATR]	ɪ		ʊ
mid [+ATR]	e		o
mid [-ATR]	ɛ		ɔ
low		a	

DISTINCTIVE FEATURES FOR VOWELS

	i	ɪ	e	ɛ	a	ɔ	o	ɒ	u
high	+	+	-	-	-	-	-	+	+
low	-	-	-	-	+	-	-	-	-
ATR	+	-	+	-	-	-	+	-	+
back	-	-	-	-	+	+	+	+	+
round	-	-	-	-	-	+	+	+	+

All vowels can be lengthened, but long mid vowels are often dipthongized. Front vowels are centralized before [ŋ]. For more details, see section 5.

2.3 SUPRASEGMENTALS

High and low tones contrast. See section 6 for details. Nasality on vowels is not contrastive.

3. EVIDENCE OF PHONEMIC CONTRASTS

Notes: Data below is presented in phonetic transcription, with allophones of a phoneme listed under that phoneme. When "a game," "an official" are listed as glosses, this indicates a particular type of game, a certain type of official. When possible, tones are from isolation forms.

	List 1 /p/	
[p]	pám	much
	pàlì	at all
	pìèsí?	to ask
	pɨ́li	to roof
	puo	to divide
	pɪttɪ	tasteless
	dàmpàlá?	log bench
	nèpó	bin
	tə̀páyà	capsule
[p^w]	p^wə̀ə̀gì	misbehave
	p^wə̀ə̀sì	pray
	náp^{w}ə̀ə̌à	calves (legs)

	List 2 /b/	
[b]	bàŋ	intend
	bálímɨ́ŋ	one
	bílsì	count
	bìtà	small
	bə́á	child
	dèmbɨ́ŋ	man
	kə́ə̌ə́ba	bowl
	sɪ́búbú	hat
[b^w]	b^wə̀bsì	scarves
	b^wə́ólúŋ	fire
	b^wə̀ə́ə̌à	sack
	-b^wə̀lɪ́?	straight
	b^wə̀bì?	to tie

	List 3 /t/	
[t]	tằŋ	stone
	tààlɪ́	sin
	tɪ́énsì	remember
	tígɨ́ŋ	house
	tə̀ə́	be hot
	tìɪ́ŋ	tree
	tàntɪ́?	earth, soil
	hə̀ə̀tɪ́?	grasses
	náátàllì	sole of foot
	dàtɪ́	to pull

	List 4 /d/	
[d]	dááŋ	alc. drink
	dáə̌ì	a game
	dìènì	yesterday
	dìgɪ́	to cook
	dúúŋ	horse
	díìŋ	forehead
	tándùŋ	pestle
	sídì	cedi (Eng)
	kòdú	banana (Twi)
[ə̌]	wáə̌à	mud block
	ŋmáə̌ɨ́ŋ	pigeon
	gáə̌ɨ́ŋ	cloth
	sə́ə̌ə̀ŋ	tomorrow
	kə́ə̌ì	to pound
	kə́ə̌ɨ́ŋ	a seat
	gə̀ə̌ə̀mánsà	a drum

List 5 /k/

[k]	kà	it
	kállì	to sit
	kààmɨ́ŋ	cheek
	kɔ̀ɔ́ŋ	hoe
	kù	the
	gbàŋkɔ̀	the letter
	mílìkì	milk
	dákɛ̀	box (Hausa?)
	sɔ̀kɔ́ŋ	morning
[k^w]	kɔ̀k^wá?	wall
	k^wɔ́ɔ́ŋ	hoe
	k^wɔ́ŋ^{w}á?	rock salt
	k^wɔ̀ɔ̀lɔ́ŋ	water calabash
	k^wɔ́lɔ̀ŋ	thick, fat
	k^wɔŋk^wɔgɨŋ	high place
	dʒɔ̀k^wɔ́rɨ́ŋ	basket
	sɛ̀k^wɔ̀ɔ́tɨŋ	spoon
	sɔ̀k^wɔ́ŋ	morning

List 6 /g/

[g]	gá	go
	gáánlùŋ	cat
	gààmɨ́ŋ	wall
	gɔ̀tì	help
	gɨ́lí	egg
	gɨŋgáŋ	drum
	sínsìgè	hiccup
	dàgì	to point
	mɔ́gɔ́ŋ	river
	gú·úŋ	rope
[g^w]	g^wú·úŋ	rope
	g^wɔ́ɔ́lɨŋ	pit
	g^wɔ́bɨ́ŋ	short
[ɣ]	mɔ́ɣɔ́ŋ	river
	lɔ́ɣɨŋ	side
	dàɣì	to point
	dɔ́ɣɛ̀tà	doctor
	hɔ̀ɣɔ́	woman
	hɔ́ɔ́ɣɨŋ	bush
	dʒɔ́ɣá	shelters
	hàɣí?	get up

List 7 /kp/

[kp]	kpɔ́ɔ́ŋ	oil
	kpàlí?	calabash
	kpìlɨ́ŋ	thigh
	kpɔ̀gɔ́	to weave
	-kpí·íŋ	fat
	sìŋkpɔ́ɔ́ŋ	groundnut
	sí·kpɨ́ŋ	head
	kàkpɔ́à	knifehandle

List 8 /gb/

[gb]	gbàáŋ	dog
	gbánɨ́ŋ	skin
	gbì?	touch
	gbóyɔ́áŋ	duck
	gbɛ̀ɛ́ŋ	pot
	tìŋgbá?	floor
	kàgbá	hat

List 9 /tš/

[tš]	tšàfɨ́ŋ	anus
	tšáánɔ̀	stranger
	tšɛ̀áŋ	waist
	tšɔ̀ř́ɔ́	husband
	tšííŋ	moon
	kòntšágá	cornstalk
	nɔ̀tšíksɨŋ	wrist
	náátšígɨ́ŋ	lion

List 10 /dž/

[dž]	džààŋ	thing
	džágɨ́ŋ	shelter
	džíbɨŋ	knife
	džɔ́ŋ	tail
	džɔ́ɔ́sì	ask
	nàndžɔ̀ɔ́ŋ	pepper
	kpódžúsúŋ	eagle
	kɔ́džágá	sores

List 11 /f/

[f]	fááŋ	baboon
	fì	you
	fòsí	to remove
	fóósà	blow
	fìɛ̀lì	be cool
	fúúřá?	a food
	àlàámfìyà	health
	tšàfɨ̀ŋ	anus
	máfàbɨ́ŋ	bullet

List 12 /v/

[v]	vááŋ	leaf
	vàrà	collect
	víígè	soap
	vìná	be good
	vósì	to rest
	ɲìŋvòkí	snakes
	bòváá	to boil
	hòvógè	girl

List 13 /s/

[s]	sàáŋ	name
	sářà	to sweep
	síbà	to know
	sóŋ	inside
	sɨ́ŋ	a fish
	síŋsìgè	hiccup
	kpásáà	to nail
	kùsì	to pound
[š]	šìyá	where
	šíìŋ	catarrh
	šììmé	beans
	šíí	to bathe

List 14 /z/

[z]	záŋ	millet
	zààmpóŋ	hedgehog
	zìé	to stand
	zóŋ	flour
	zɨ́ŋ	blood
	nɨ́nzòsì	eyelashes
	názòà	an official
	dòòzóŋ	yellow
[ž]	žììgɨ́ŋ	pole

List 15 /l/

[l]	lálá	to play
	lìgìří	money
	lógìŋ	side
	kúlì	go home
	gáánlùŋ	cat
	gʷóólɨ̀ŋ	pit
	wútúlúŋ	stomach

List 16 /n/

[n]	náŋ	leg
	nándžúóŋ	fly
	nììřɨ́ŋ	shoe
	nɨ́ŋ	eye
	nóáŋ	mouth
	tàntí	earth, soil
	ŋmáánà	okro
	kpíínè	guinea fowls
	kàànί	single

List 17 /m/

[m]	máná	all
	mìnìá	who
	mógóŋ	river
	màsóŋ	welcome
	mèmíè	rice
	tèmbɨ́ŋ	mortar
	dàmpàlá	log bench
[mʷ]	mʷúúlɨ̀ŋ	be red

List 18 /ŋ/

[ŋ]	àŋàŋ	and
	nìŋà	front
	sóŋì	to help
	sìŋkpááŋ	groundnut
	nɨ̀ŋkógè	eyebrow
	dúŋ	knee
	nɨ́ŋ	eye
	tãŋ	stone
[ŋʷ]	kʷóŋʷóŋ	saltpetre (Hausa)

List 19 /ŋm/		List 20 /ɲ/	
[ŋm] ŋmáánà	okra	[ɲ] ɲááŋ	water
ŋmóŋ	sun	ɲɨ́é?	neck
ŋmářéŋ	pigeon	ɲóŋ	yam
ŋmóndářɨ́ŋ	spider	ɲɨ́ŋ	partridge
ŋmɨ̀èsɨ́ŋ	cooking water	nàmbóɲúúřɨ̀ŋ	sw.potato
ŋ̀mgbáŋ	myself	ɲɨ̀lɨ́ŋ	guineaworm
džɨ̀ŋmɨ́ŋ	evening	ɲùòtí	stomach
áŋmɨ̀yà	how much?	ɲúóŋ	chest

List 21 /y/		List 22 /w/	
[y] yà	have	[w] wà	him
yáyà	hip	wóŋ	long
yéé̱	see	wíɨ̀ŋ	matter
yí'íŋ	nail	wářà	mud blocks
yúgà	weave	wó	lack
yɨ́sɨ̀ŋ	sheep	wóóřɨ́	to shell
tèŋyéé'lɨ́ŋ	ashes	kàwóntà	corn
gb^{w}ɨ̀yòáŋ	duck		
náyɨbɨ̀ŋ	toenail		

List 23 /h/	
[h] háágɨ̀ŋ	bush
hágɨ	get up
hɔ̀gɔ́	woman
hɔ̀ɔ̀tɨ́	grasses
hɔ̀ɔ̀gɨ̀	be rotten
hámɨ̀ŋ	debt
hàgɨ̀tɨ́	shells (n)
hànyé	a dirge

List 24 /a/		List 25 /aa/	
[a] dàtɨ	pull	[aa] dààtɨ̀	get wood
maná	all	ŋmáánáŋ	okra
hágɨ̀	get up	háágɨ̀ŋ	bush
gèènáŋ	here	gáánlùŋ	cat
džɨ̀ɨ̀má	to watch	mímáàŋ	lungfish
sàŋkpáŋ	a bird	zààmpóŋ	hedgehog
gà	go	bàà	intend
wářà	mud blocks	kpááŋ	oil
náŋ	leg	wàářɨ́?	a game
-gbàŋ$_{w}$	self	dàáŋ	day
[ə] gbə̀ŋk^{w}óŋ	cassava	nàáŋ	chief
bə́ŋsɨ̀lɨ̀è	twenty	gbàáŋ	dog
kə̀lɨ́	to sit		

List 26 /i/

[i]	zí?	not know
	yì	to make, do
	síná	to own
	síbí	to be dark
	vììsí?	to revolve
	džìmá	to watch
	yítàmà	to think
	tšígí	to carry
	yìsɨŋ	an antelope
	tígɨŋ	house
[ɨ]	Note: some of these may well belong under /ɪ/.	
	bɨŋ	seed
	ɲɨŋ	partridge
	wářɨŋ	block
	bɨŋkpíàŋ	shoulder
	džílɨŋ	tongue
	bɨlá	watering place
	gɨlí?	egg
	bɨllógà	bags

List 27 /ii/

[ii]	tšíí	carry (head)
	šììmé?	beans
	bìíŋ	goat
	kpììlɨŋ	ancestor
	vììgè	soap
	díísì	put on top
	níířɨŋ	shoe
	kpíínè	guinea fowls

List 28 /ɪ/

[ɪ]	yì	to give
	bìtá	small
	sínsìgè	hiccup
	tšígí	to run
	džìnné?	today
	yísɨŋ	sheep
	kpàlí?	calabash
	džítí?	soup
	síbí	to know

List 29 /ɪɪ/

gbí!ín	sleep
yí!ín	arrow
wíín	problem
yíì	blindness
tìì řì	straighten
nììtí	rains
kpììlɨŋ	thigh

List 30 /e/

[e]	šììmé?	some beans
	wùté	flower
	lélégè	just now
	ɲììlé?	g.worms
	vììgé	soap
	dèmbɨŋ	man
	kéŋ	come
[ə]	kəŋ	come
	bəkwàì	week

List 31 /ee/

[ee]	gèè	here
	gbèéŋ	pot
	lèèmí	orange
	pèètʷó	trousers (?)pants
[ie]	gìè	here
	zìé	to stand
	yìé	to see
	sìèbíè	bees
	wìéllì	to sit near fire
	bìtíéŋ	chin
	síéŋ	path
	gbìèké	the pot

List 32 /ɛ/

[ɛ]	yésɨŋ	carving
	tšémàà	fry
	tšìsé?	wait

List 33 /ɛɛ/

[ɛɛ]	džèètí	go fishing
	kpééŋ	chicken
	yééntí	to find out
	léèŋ	ax
[ɪa]	bìà	what
	bɨŋkpìáŋ	shoulder
	kpíáŋ	chicken
	líàŋ	ax
[ɪɛ]	dìèní	yesterday
	fìèlí	cool
	tìélɨŋ	owner
	pìèsí	ask
[ɛa]	gbéàbɨŋ	door
	tšèáŋ	under-side
	kàlèŋgbéàŋ	mussel
	kpéáŋ	chicken

List 34 /u/

[u]	ù núŋ	his mother
	dúŋ	knee
	džù	to enter
	kúsí	pound
	kúdžágá	sores
	lékúlí	hoe handle
	wúté	flower
	sùgùří	to wash
	kúŋ	death, funeral

List 35 /uu/

[uu]	gú!úŋ	rope
	dúúŋ	horse
	ù núúŋ	his arm
	sùùlí	be full
	núúsí	arms
	nàmbóŋúúřɨŋ	sweet potato
	ŋ̀nyúúřè	thirst
	m̀úúlɨŋ	red

List 36 /ɷ/

[ɷ]	kɷ́ŋ	hunger
	džɷ́ŋ	tail
	zɷ́ŋ	flour
	sɷ́ŋì	to help
	sɷ́gì	dip in soup
	dɷ́ŋ	to bite
	sɷ́ŋ	broom
	sɷ́nsɷ́ŋ	midst, shade
	nàtšík'sà	wrist
	gbɷ̀yɷ̀áŋ	duck

List 37 /ɷɷ/

kɷ̀ɷ́ŋ	hoe
džɷ̀ɷ́ŋ	room
zɷ́ɷ́ŋ	vulture
vɷ̀ɷ̀tá	person
sɛ̀kɷ́ɷ́tɨŋ	spoon
dɷ̀ɷ́ŋ	dawadawa tree
sɷ̀ɷ́ŋ	to come down
bɷ̀ntɷ̀ɷ́ŋ	toad

List 38 /o/		
[o]	wó	to lack
	ɲõŋ	yam
	góbí	to cut
	nìŋkógɬŋ	eyebrow
	tšìákóřóŋ	scorpion
	kóŋ	a tree

List 39 /oo/		
[oo]	bóólúŋ	fire
	vóósì	to rest
	góóřì	stop fighting
	Bàkóódèŋ	lower Yikpabongo
[uo]	kùòlɬŋ	gourd
	tùóŋ	baobab
	nándžúóŋ	fly
	ɲùógsà	sharpen
	ɲùòté	stomach
	ɲúóŋ	chest

List 40 /ɔ/		
[ɔ]	dɔ̃ŋ	herd animal
	nɔ́ŋ	meat
	hɔ̀gɔ́	woman
	bɔ́bì	to tie
	dɔ́gí	to carry
	dž^{w}ɔ́řɔ́ŋ	ladder
	wɔ́sígá	dried T.Z.
	sɔ́bɛ́ɬŋ	black
	bɔ̀llɔ̀ɣsɔ́ŋ	wind
	k^{w}ɔ̀làk^{w}ɔ̀là	light blue
	kɔ̀ŋkɔ̀má	a fruit
	kɔ̀lí	penis
[wa]	kwàlí?	penis
	kwátì	lift up
	kwálɬŋ	dust
	kwàbɛ́ŋ	bone
	kɔ̀kwábɛ̀ŋ	feather

List 41 /ɔɔ/		
[ɔɔ]	wɔ́ɔ́řa	to stir
	k^{w}ɔ̀ɔ̀lɬŋ	thick, fat
	náp^{w}ɔ̀ɔ̀řà	leg calves
	pɔ̀ɔ̀lí	to divide
	dɔ̀ɔ́ŋ	to mix
	bɔ̀ɔ́řɛ̀sì	bags
[ɷa]	kɷáŋ	farm
	lɷáŋ	culvert
	gbɔ̀ɣɔ̀áŋ	duck
	núú́kɷáŋ	back of hand
	dɔ̀áŋ	bush pig
	dɔ̀ágɣ́	lie down
	ŋmɔ́ńtɷ́ásí	afternoon
	zɔ̀à	friend
	nɔ̀áŋmɬŋ	pestle
	bɔ̀álɬŋ	calabash
[ɷɔ]	kɷ́ɔ́-kɷ́	the farm

4. PHONOTACTICS

4.1 SYLLABLE STRUCTURE

4.1.1 Normal Sequences

I posit syllable patterns in Kɔnni of N, V, CV, CVV, CVC, and CVVC, with VV representing long vowels. However, N and V are rare and restricted to certain grammatical morphemes, leaving the normal pattern of CV(V)(C). Syllable-final consonants are always nasals or /l/.

N, the syllabic nasal, is a syllable pattern whose occurrence is limited to the first person singular pronoun. It occurs before nouns as a possessive pronoun, or before verbs as a subject pronoun. N assimilates to the following consonant in place of articulation (see Section 5.1.5).

V in native Kɔnni words occurs only in certain grammatical morphemes, e.g. [à] 'and,' [ù,ò] 3rd singular pronoun, [ìyè] 'where.' The vowels /a,ɪ,ʊ,u/ are the only ones found as V syllables up to this point. V also occurs in some borrowed words and borrowed proper names, e.g. [àlìbɛ́lsà] 'onion,' [Isa], [Amina].

CV is by far the most common syllable pattern. Any of the phonemic consonants of Chapter 2 can occur in the C position and any phonemic vowel in the V position.

CVC has a severe restriction in that the only possibility for the latter C is N, or in non-word-final syllables, /l/. If the C comes word-finally, N is always ŋ; otherwise, it assimilates in place to the following consonant just as the first person singular pronoun above. Any phonemic vowel may occur in the V position.

Long vowels are interpreted to be sequences of like vowels in this paper.

Syllables containing VV will be assumed to be single syllables on the basis of their tonal behavior; they can bear a maximum of two tones, just the same as short-voweled syllables (see Section 6). Vowel length is contrastive for all nine phonemic vowels. Long mid vowels diphthongize, and reasons for identifying surface vowel sequences as manifestations of long vowels are discussed in 4.1.2.1 and 5.2.5.

For data illustrating these syllable types, see Section 4.2.2 below.

4.1.2 Problematical Sequences

4.1.2.1 Heterogeneous Vowel Sequences

The surface phonetics has several vowel sequences - [ie, ɪɛ, uo, ʊɔ, ɪa, ʊa, ɛa]. The question is how these are to be interpreted - as heterogeneous vowel sequences, as allophones of unitary vowels, or as underlyingly VCV, with a glide between the vowels.

The sequences [ie, ɪɛ, uo, ʊɔ] can be shown to be diphthongs that manifest the long mid vowels /ee, ɛɛ, oo, ɔɔ/. See 5.2.5 for

details. However, [ie] with a morpheme break is also found in some plurals, e.g. [bi-e] 'goats.'

For the sequences [ɪa, ɛa, ɷa], the first major question to consider is whether there is a glide present or not. That is, whether rather than /zɷa/, /wɪa/ ('friend,' 'problems'), the representation may be /zɷwa/, /wɪya/.

Two considerations favor the presence of the glide. First, these are suspect sequences, in which it can be difficult or impossible to actually hear the presence versus absence of a glide. There are no non-suspect vowel sequences, and it is suspicious that of all possible vowel sequences, the only 'attested' ones are suspect. Second, there is a strong tendency towards CV or CVC syllables in this and other related languages; positing these as separate vowels would add two syllable types, CVV and CVVC, to the syllable inventory, adding complexity to the structure of the language.

However, other factors favor representing the items in question as vowel sequences. Sequences of /ɪya/ do exist in Kɔnni. There are at least two ways to differentiate between /ɪa/ and /ɪya/ - one phonological and one phonetic. Phonologically, within words, there is an alternation in pronunciation between [ɪa, ɛa, ɛɛ], e.g. [kpɪaŋ, kpɛaŋ, kpɛɛŋ] 'chicken.' Thus [ɛa, ɛɛ, ɪa] are all allophonic variants. (See 5.2.5.2 for details.) The rules to produce these variants never occur in forms for which I have postulated /ɪya/, e.g. /sìyá/ 'where.'

Phonetically, a difference can often be heard between the two forms, /ɪa/ being shorter and more of a unitary nature than /ɪya/. This is supported by instrumental timings, in which 8 samples of /ɪya/ had an average duration of 0.30 seconds, while 6 samples of /ɪa/ had an average duration of 0.24 seconds. (For [+ATR] forms, for which [e] is the counterpart of [a] after /i/, the average times were 0.33 seconds for 5 samples of /iye/ and 0.24 seconds for 8 samples of /ie/. All test cases involved morpheme boundaries at the end of words, e.g. [kpasɪ-ya] 'have repaired,' [siti-ye] 'have poured,' [sɪ-a] 'a fish (pl.),' [bi-e] 'goats').

The second major question is whether [ɪa, ɛa, ɷa], like the first phonetic vowel sequences, can be derived from underlying long vowels. There are at least two reasons for favoring such an analysis. First, the underlying syllable inventory of Kɔnni would be simplified. Second, there is some evidence from related languages indicating that historically, they were /ɛɛ, ɔɔ/. The variants [ɪa,ɛa,ɛɛ] in [kpɪaŋ, kpɛaŋ, kpɛɛŋ] 'chicken' can in fact be derived from an underlying /ɛɛ/ (see 5.2.5.1).

As noted above, some vowel sequences are the results of two morphemes joining together. Phonetically, these are identical to monomorphemic vowel sequences. I will provisionally treat these as identical to monomorphemic vowel sequences as far as syllable structure is concerned.

Therefore, I will tentatively posit all monomorphemic heterogeneous vowel sequences to be manifestations of long vowels, and all vowel sequences, from whatever source, to be in the same syllable.

4.1.2.2 Labialized Consonants

Stops often exhibit labialization, e.g. [k^{w}ɔ̀ɔ̀lɔ́ŋ] 'water calabash,' [kwálɬŋ] 'dust.' The question is whether these labialized consonants are allophones of simple consonants (/k/, in this example), are to be considered as sequences such as /kw/ or /ku/, or are manifestations of another phenomenon. The cases fall into two groups, represented by the words above. In the first, the consonant in question is followed by a round vowel. In the second, the consonant in question is followed by the vowel [a].

Let us consider [k^{w}ɔ̀ɔ̀lɔ́ŋ] first. If [k^{w}] is a manifestation of /ku/, then there is a sequence VVV, which is completely unattested in any unambiguous word. If /kw/, then there is a sequence CC word-initial, which again, does not occur in any non-suspect sequence. Most importantly, [C^{w}] is predictable, since it only precedes round vowels. Therefore I conclude that [k^{w}] here is an allophone of /k/ manifested preceding round vowels. That labialization does not occur every time a consonant precedes a round vowel means the rule governing it is optional (see 5.1.1).

The case of [kwálɬŋ] requires a different explanation. This and other cases of [kwa---] have alternate pronunciations such as [kɔ́lɬŋ], that is [wa] ~ [ɔ]. Other Oti-Volta languages, such as Mampruli, exhibit the same phenomenon (Naden 1988:22). Therefore, I will regard this [kwa] as a surface phonetic form of the underlying [kɔ], a CV syllable. (see 5.2.6)

4.1.2.3 Possible VC Syllable

Phonetic VC consistently occurs in only one morpheme to my knowledge, in the grammatical particle [án], e.g., [án tì yìsɬŋ] 'how's our seeing?' It is suspect as a syllable type even here, the [n] probably being a phonetic detail rather than a phonemic representation. In a parallel case, a phonetic N sometimes appears in [ǹ kán ˈdáá] 'I won't buy', but in spelling the Koma say it is (n ka daa), and react definitely against including [n] as part of /ká/. It may be that certain grammatical morphemes exhibit [N] before an alveolar stop, and the nasal here needs more investigation. (Another possibility for VC is in [aŋaŋ] 'with,' as a reduplicated VC syllable, but this is better understood to syllabify as V.CVC.)

4.1.2.4 Possible N syllable word-finally

Many words sound at first as if they could be transcribed with either [-ɬŋ] or [-ŋ̀] (or the high-tone equivalents). A little investigation shows the underlying form to be /iŋ/ or /ɩŋ/ (see 5.2.1), though the vowel is often severely reduced. (Another possibility is that in some words the morpheme /ŋ̀/ is added to a consonant-final root, and there is vowel epenthesis.)

4.1.2.5 Problematic Medial Consonant Clusters

No CC sequences appear syllable-initially, but certain ones do occur word-medially. In nearly all of these, the first C is a nasal consonant belonging to the first syllable, e.g. [bàntɔ̀ó$\eng$]. These are already covered in the section above on CVC. However, there are a few cases of geminate or long non-nasal consonants in words. These are [tóggò] 'smock,' and [dí̠kkɛ̀] 'cooked.' There are also a few [Cs] sequences, e.g., [b^{w}ɔ̀bsì] 'headscarves' and [bɬllɔ̀gsɬ$\eng$] 'wind.' If we take these at face value, there exist CVC syllables whose last C is /g, k, or b/.

For the present, I have no explanation for the medial geminates. The [Cs] combinations I take to be elisions from /Cɪs/, with which they vary ([b^{w}ɔ̀bìsì], [bɬllɔ̀gìsɬ$\eng$] are attested). Thus the phonetic structure may be the result of processes which modify the underlying phonemic syllable structure.

4.2 MORPHEME AND WORD STRUCTURE

4.2.1 Phoneme Restrictions

The phoneme /h/ in the Yikpabongo dialect occurs only morpheme-initially. The only cases it occurs word-internally is when there are clearly two or more morphemes involved, as in the expression [tìgì-háálɬ$\eng$] 'house-new' (a new house).

In the Yikpabongo dialect, /$\eng$/ never occurs word-initially, except in the exhortation [$\eng$áà] 'listen!'. As previously mentioned, when there is a nasal consonant utterance-finally, it is always [$\eng$].

4.2.2 Syllable Position Restrictions

In the syllable structures postulated above, the N syllable is restricted to one morpheme and the V syllable is restricted to word-initial position.

A CV syllable can occur in any position in words of any length, the longest found so far being five syllables:

(1)	[bà]	'they'	[gɔ̀rɔ̀mánsà]	'a drum'
	[lɔ́gì$\eng$]	'side'	[kpàlìmántìyà]	'cattle egret'
	[sùgùřì]	'wash'		

A CVC syllable ending in N can occur in any position in a word:

(2)	[náŋ]	'leg'	[tàntí]	'soil'
	[sɔ̀kɔ́$\eng$]	'morning]	[dàmpàlá]	'log ben
	[sìgìlí̠nsìgè]	'hiccup'	[sì$\eng$kpáá$\eng$]	'groundnut'

A CVC syllable ending in /l/ may only occur in non-final position:

(3)	[yáltò]	'hunter'	[bɬllɔ́gɬ$\eng$]	'sack'

(In some medial [ll] sequences, it may be that the first consonant is underlyingly /n/ and it has assimilated to the /l/.)

Syllables with long vowels can occur as single words. In polysyllabic words, the initial syllable is by far the most common position for the long vowel. No morpheme with more than one CVV syllable has been found.

(4)

CVV		CVVC	
[gèè]	'here'	[kpááŋ]	'oil'
[dóà]	'lie down'	[líàŋ]	'ax'
[kpíí'lɨ́ŋ]	'hawk'	[gáánlùŋ]	'cat'
[ŋmɔ̀ntɔ̀ásì]	'afternoon'	[gbɔ̀yɔ̀áŋ]	'duck'

4.3 Vowel Harmony

Kɔnni exhibits a vowel harmony system based on the Advanced Tongue Root ([ATR]) feature, contrary to Naden (1987). Each phonemic vowel belongs to one of two sets as follows:

(5)

+ATR		-ATR	
i	u	ɪ	ʊ
e	o	ɛ	ɔ
		a	

In addition to these phonemic vowels, /a/ has an allophone [ə] when in a word belonging to the [+ATR] set. It also alternates with /e/ in some affixes (see 4.3.1.1).

All vowels in a word will usually belong to either one set or the other. Therefore there are very few words combining /a/, a [-ATR] vowel, with any of the [+ATR] vowels. The [-ATR] set is much more common: in an examination of 93 nouns and 156 verbs, 78% of the words were [-ATR].

4.3.1 Extent of Vowel Harmony

4.3.1.1 Affixes

Affixes of nouns and verbs will agree in ATR with the value of the stem, suggesting that these affixes are part of the phonological word.

(6) Future aspect marker: [nən/nan]

[+ATR]		[-ATR]	
[ù-nèn-sítí]	'he will pour'	[ɔ̀-nàn-sɪ́bá]	'he will know'
[ù-nèŋ-góbí]	'he will cut'	[ɔ̀-nàn-dáá]	'he will buy'
[ù-nèn-tšúúří]	'he will have diarrhea'	[ɔ̀-nàn-tšɔ́řɪ́]	'he will write'

(7) Perfective aspect marker: [ye/ya]

[ù-sìì-yé]	'he has danced'	[ò-sìì-yá]	'he has bathed'
[ù-yè-yé]	'he has seen'	[ò-yì-yá]	'he has given'
[ù-tùù-yé]	'he has dug'	[ò-tòn-yá]	'he has worked'

(8) Definite articles (from various noun classes):

[bíé-hé]	'the seeds'	[dàřá-há]	'the stick'
[síé-kú]	'the path'	[síí-kó]	'the sneeze'
[kùm-bú]	'the funeral'	[kóm-bó]	'the hunger'
[gbìè-ké]	'the pot'	[džìì-ká]	'the cobra'

Note that in (6) and (7) the personal pronoun is also part of the domain of vowel harmony.

4.3.1.2 Numbers

Numbers modifying a non-human noun have a prefix /a-/. This is not affected by the ATR feature of the preceding noun. In fact, whether or not the noun ends in a [+ATR] vowel, that vowel quality is dropped in favor of the /a/. Here the number modifying the noun begins a new harmony domain.

(9)

/dùùné àtâ/	-->	[dùùná átâ]	'three horses'
/gbààsí àtâ/	-->	[gbààsá átâ]	'three dogs'

5. PHONOLOGICAL PROCESSES

A selection of processes accounting for segmental variations will be presented here. The rules mentioned do not exhaust the processes of Kɔnni. There are many other areas that could bear more investigation, some of which will be mentioned below.

My theoretical orientation is, broadly, generative phonology, and the rules below are given in the framework of distinctive features.

5.1 PROCESSES AFFECTING CONSONANTS

5.1.1 Labialization

As noted in Sections 2 and 3, the simple stops /p,b,k,g/ have labialized allophones, that is, [p^w,b^w,k^w,g^w]. (There is a question about the coronal consonants. I have few labialized ones, but these are the ones that seem always to trigger diphthong formation (5.2.5).) The vowel following these labialized consonants is invariably a back round one:

(10) [p^wɔ̀ɔ̀gì] 'to misbehave' [b^wɔ̀bì] 'to tie'
[sɔ̀k^wɔ́ŋ] 'morning' [g^wóólɨ̀ŋ] 'pit'

Note that several of these have alternate transcriptions in which the consonant is not labialized, e.g. [sɔ̀kɔ́ŋ]. Thus the rule is optional. We can formulate a rule that labializes non-coronal stops preceding a round vowel as follows:

(11) Labialization: (optional)

$$\begin{bmatrix} C \\ -cnt \\ -cor \end{bmatrix} \longrightarrow [+rd] \; / ___ \; \begin{bmatrix} V \\ +rd \end{bmatrix}$$

5.1.2 Palatalization

Both /s/ and /z/ have palatalized allophones [š] and [ž], respectively, before /i,ɪ/. I have heard the same words both with and without palatalization:

(12) [sɪyá] ~ [šɪyá] 'where?'
[sɪ̀ɪmé] ~ [šɪ̀ɪmé] 'beans'
[zɪ̀ɪgɨ́ŋ] ~ [žɪ̀ɪgɨ́ŋ] 'center pole'

The rule to express this is:

(13) Palatalization I: (optional)

$$\begin{bmatrix} C \\ +cor \\ +strid \end{bmatrix} \longrightarrow [+high] \; / __ \; \begin{bmatrix} V \\ +high \\ -back \end{bmatrix}$$

The pronunciation for 'scorpion,' [tšákòřòŋ], alternates with [tìákòřòŋ]. (However, there is a contrast in /tši--/ and /ti--/, as shown by [tìíŋ] 'tree' vs. [tší'íŋ] 'squirrel.') I suggest that in /tìákòdòŋ/ the /t/ becomes palatalized to [tš] under the influence of the /i/. The /i/, in turn, is barely audible. Interestingly enough, there are no clear cases of [dia] and few of [tia] in my data. I assume most of them are pronounced as [dža] and [tša], and where there would be ambiguity if /t/ --> [tš], as in 'squirrel' and 'tree' above, the speaker keeps the pronunciation with [t]. While the evidence for /t/ is limited to one clear case and the evidence for /d/ is by silence only, I will tentatively assume the same rule applies to /t,d/:

(14) Palatalization II: (optional)

$$\begin{array}{ccccc} C & \text{---} > & [+high] & / __ & V \\ [+cor] & & [+del\ rel] & & [+high] \\ [-cnt] & & & & [-back] \end{array}$$

5.1.3 Intervocalic Weakening (g and d)

When the phoneme /g/ occurs intervocalically, it can be heard as either [g] or [ɣ]:

(15) [mógóŋ] ~ [móɣóŋ] 'river'
[dàgì] ~ [dàɣì] 'to point'

This rule does not apply across word boundaries, as seen in e.g., [ò gá tìɣɨŋ] 'he's gone to house.' Therefore we have an optional rule as follows:

(16) Spirantization of g: (optional, within words)

$$\begin{array}{lll} C & \text{--} > [+cnt] / V__V \\ [-cnt] & & \\ [+voi] & & \\ [+back] & & \end{array}$$

Between vowels, /d/ weakens to [ř]. The only cases of intervocalic [d] are in a handful of borrowed words, e.g. [kòdú] 'banana' (from Twi). The weakening is seen in the complementary distribution of [d] and [ř], [ř] occurring intervocalically and [d] occurring elsewhere (for the one exception, see 5.1.4). This flapping occurs only within words, leaving expressions such as [ù dìé mɨŋ] 'he is eating' intact.

(17) [dàáŋ] 'stick' [wářà] 'mud blocks'
[dùùtí] 'dawa-dawa powder' [sóřòŋ] 'tomorrow'
[tándùŋ] 'pestle'

The rule will be:

(18) D Flapping: (within words only)

$$\begin{matrix} C \\ [-cnt] \\ [+voi] \\ [+cor] \end{matrix} \rightarrow [+cnt] \; / \; V__V$$

5.1.4 Total Assimilation of /d/

In two morphemes noticed so far, the /d/ postulated as the basis for [ř] totally assimilates to the preceding consonant.

(19) (a)

[vɔ̀ɔ́n-nɪ̀ŋ]	'person-too'	[ɔ̀-ř̀ɪ̀ŋ]	'he-too'
[ŋmɔ̀ndàř̀ɪ́n-nɪ̀ŋ]	'spider-too'	[bɔ̀á-ř̀ɪ̀ŋ]	'child-too'
[kùl-lɪ̀ŋ]	'tortoise-too'	[hɔ̀gɔ́-ř̀ɪ̀ŋ]	'woman-too'

(b)

[bɪ́n-nɪ́]	'the seed'	[bɪ́ísí-ří]	'the breast'
[bɨ̀n-nɪ́]	'the year'	[dàà-ří]	'the day'
[dàmpàl-lɪ́]	'the log'	[bɨ́llɔ́gɛ́-ř́ɪ́]	'the bag'

The boundaries are particularly crucial here. /-dɪɛŋ/ and /-dI/, to be consistent with rule (18), must be bound morphemes that comprise part of a word, in order to undergo the change to [ř] in the right column examples. Within monomorphemic words the [nd] sequence occurs, as seen in chapter 3. Here, however, the /d/ assimilates across the morpheme boundary to the preceding consonant. Since /N/ or /l/ are the only consonants that may terminate a syllable, these are the ones to which /d/ may assimilate.

(20) D-Assimilation

$$d \rightarrow C_i \; / \; C_i + __$$

5.1.5 Nasal Assimilation

A nasal consonant will always assimilate in point of articulation to a following consonant. Within a morpheme, there is no alternation observed, of course, but the process can be seen clearly across word boundaries.

(21)

within morphemes:		across words:	
[dàmpàlá]	'log bench'	[m̀ bɔ́á]	'my child
[dánsɪ̀]	'to watch'	[ǹ tɪgɨ́ŋ]	'my house'
[gɪ̀ŋgáŋ]	'a drum'	[ŋ̀ gúúŋ]	'my rope'
[sɪ̀ŋkpááŋ]	'groundnut'	[ŋm̀ gbáŋ]	'my self'

One difference that can be seen in the two lists above is the degree to which the nasal assimilates to the following consonant in the case of labiovelar consonants. Within words, a nasal is [ŋ] before /gb,kp/, but across words it becomes [ŋm]. Note also:

(22) within words: across words:

[kàlèŋgbé!éŋ]	'mussel'	[ŋm̀ gbòŋgbóŋè]	'my chicken'
[k^{w}ɔ́ŋgbáàŋ]	'ant-lion'	[ŋm̀ kpářɬŋ]	'my basket'
[tìŋgbáŋ]	'floor'	[ŋm̀ kpàtìyá]	'I've finished'
[sàŋkpářɬŋ]	'navel'	[ŋm̀ gbé fò]	'I touch you'
[bɬŋkpìáŋ]	'shoulder'	[sìŋkpáŋm kpááŋ]	'groundnut oil'
[tăŋ-kpííŋ]	'mountain'		
[ŋìŋ-kpíímâ]	'big things'		

The last two words in the left column have the adjective form for 'big' attached to a head noun. So there are two rules of nasal assimilation, depending on the boundary or lack of it:

(23) Nasal Assimilation I (within words)

$$\begin{matrix} C \\ [+nas] \end{matrix} \longrightarrow [\alpha pt] \; / __ \; \begin{matrix} C \\ [\alpha\ pt] \end{matrix} \qquad \text{(note: N --> ŋ /__kp,gb)}$$

(24) Nasal Assimilation II (across words)

$$\begin{matrix} C \\ [+nas] \end{matrix} \longrightarrow [\alpha pt] \; / __ \; \# \; \begin{matrix} C \\ [\alpha pt] \end{matrix} \qquad \text{(note: N --> ŋm /__kp,gb)}$$

There is some question as to whether subject pronouns should be considered a component part of the verb word, or be considered a word in their own right. This would bear on the exact formulation of the above.

5.1.6 Glottal Substitution

Many glottal stops in Kɔnni occur at the end of words. Some of them can be traced to a replacement of the nasal consonant [ŋ] terminating a word:

(25) [dàáŋ] ~	[dàá?]	'day'	(Data in the right column
[tšɛ́èŋ] ~	[tšɛ́à?]	'chair'	is all utterance-final,
[mógòŋ] ~	[mógò?]	'river'	and final vowels are
[tìŋgbáŋ] ~	[tìŋgbá?]	'floor'	nasalized.)

For these glottal stops, the rule producing them is:

(26) Glottal Substitution I: (optional)

$$ŋ \longrightarrow ? \; / __\#$$

Other V? sequences can be posited as being a manifestation of word-final long vowels. Note that many polysyllabic words in the wordlist in section 8 end in V?. There are very few long vowels word-finally in polysyllabic words. Also, I have a few cases of alternation between the two, such as:

(27) [bʷɔ̀bíˊ] ~ [bʷɔ̀bíʔ] 'to tie'
[ɲíˊnáà] ~ [ɲíˊnàʔ] 'teeth'

The rule for producing these glottal stops is:

(28) Glottal Substitution II: (optional)

V --> ʔ / VCV__#

I do not exclude the possibility of other sources of final glottal stop.

5.2 PROCESSES AFFECTING VOWELS

5.2.1 Centralization of Front Vowels before ŋ

The short front vowels /i,ɪ,e,ɛ/ have central allophones [ɨ, ə] before [ŋ].

(29)	[tígɨ́ŋ]	'house'	vs.	[tígíří]	'the house'
	[nɨ́ŋ]	'eye'		[níˊnɛ̀]	'eyes'
	[ɲɨ́ŋ]	'tooth'		[ɲíˊ-ká]	'the tooth'
	[kpɪ̀ɪ̀lɨ́ŋ]	'thigh'		[kpɪ̀ɪ̀lɪ̀-ká]	'the thigh'
	[kə́ŋ]	'come'		[kʸə́-řé]	'come!'

The rule for the front vowels is:

(30) Front Vowel Centralization:

$$\begin{matrix} V \\ [-back] \end{matrix} \quad \text{--> } [+back] \text{ / } C ___ \begin{matrix} C \\ [+nas] \\ [+back] \end{matrix}$$

With the data above, another interpretation is that the crucial environment is closed syllables rather than preceding [ŋ]. However, we have [dém.bɨ̀ŋ] 'man,' [bín.tɪ̀] 'feces,' and others, in which front vowels do not centralize in closed syllables which do not terminate in [ŋ].

5.2.2 Agreement with Following Glide

High vowels will agree in roundness and backness with a following glide /y/ or /w/. Part of the evidence for this comes from distribution patterns: there are no cases of intramorphemic [Iw] and very few if any of [Uy] (/gbɷyɔɔŋ/ 'duck' is the only case I know, and even that is often heard as [gbʷɪyɷaŋ]). In addition, there are more concrete cases of variation across word boundaries:

(31)	[yíˊ bá]	'give them'	vs.	[yɷ́ wá]	'give him'
	[yàgà díˊ]	'drive-follow'		[dɷ́ wà]	'follow him'
	[ɔ̀ líísí]	'he dodges'		[wíˊ yàgà]	'he drives'
	[á kɷ̂]	'to be dry'		[kà kʷɪ̀-yá]	'it has dried'

See sentences 9-10 of the text in Chapter 7 for the second and third examples of (31). The rule is:

(32) Glide Agreement:

$$V \;\; [+hi] \;\; \text{--->} \;\; \begin{matrix}[\alpha \text{ rd}\ ] \\ [\beta \text{ bac}]\end{matrix} \;\; / \;\; __ \;\; G \;\; \begin{matrix}[\alpha \text{ rd}\ ] \\ [\beta \text{ bac}]\end{matrix}$$

5.2.3 Fronting of A

When /a/ is followed by a syllable with /i,ɩ,e/, the /a/ often, but not always, is pronounced [ɛ]:

(33)			
	[yálì]	[yɛ́lì]	'hold'
	[gbàlìgì]	[gbɛ̀lìgì]	'be tired'
	[bálìkà]	[bɛ́lìkà]	'speaking'
	[yààsɩ́ʔ]	[yɛ̀ɛ̀sɩ́ʔ]	'salt'
	[tànyéé'lɨ̀ŋ]	[tɛ̀nyéé'lɨ̀ŋ]	'ashes'

In its most general form, assuming /a/ fronted before ALL front vowels, the rule would be:

(34) A Fronting (optional)

$$V \;\; [+low] \;\; \text{--->} \;\; [-back] \;\; / \;\; __ \;\; C \;\; V[-back]$$

Note: in some words /a/ does not ever seem to front, e.g. [kàànɩ́] 'one,' and [wátɩ́] 'cold'. Whether this is a data gap or a different phenomenon is a matter for further investigation.

5.2.4 Vowel Sandhi

The behavior of heterogeneous adjacent Kɔnni vowels is a subject that needs considerably more investigation. The observations below are merely a start, recording the alternations I have observed thus far.

5.2.4.1 ɩ + ʊ --> ʊʊ

The expression /dɩ́ U keŋ/ 'he should come' is realized as [dʊ́ʊ́ kéŋ] (c.f. [dɩ́ fɩ́ kéŋ] 'you should come'). The sequence /ɩ+ʊ/ coalesces into [ʊʊ]. How general the process is is not known. Since there are no /IU/ sequences within morphemes, the rule must be across morphemes or possibly words. The process is obligatory in the case of this utterance.

(35) Vowel Sandhi I

ɩ + ʊ --> ʊʊ

5.2.4.2 /front vowel/ + a --> aa

When a sequence /front vowel/ + /a/ occurs across a word boundary, the first vowel totally assimilates to the [a]:

(36)	[dùùné]	[dùùnáˌàlì]	'horses, two horses'
	[vààtí]	[vààtáˈátâ]	'leaves, three leaves'
	[nííɡè]	[nííˈgá átâ]	'cows, three cows'

The only data I have at present is the construction with numbers as above; I presently have no information whether this happens with back vowels. [ɪa, ɛa] sequences do occur, but these are manifestations of /ɛɛ/ (see 5.2.4.3). Tentatively, then, the rule is:

(37) Vowel Sandhi II

$$\begin{matrix} V \\ [-bac] \end{matrix} \quad \# \; a \;\; \text{--> aa}$$

Alternatively, the processes in both (35) and (37) could be viewed as elision of the first vowel and compensatory lengthening of the second. To decide between these two is beyond the scope of this paper.

It may be that the above two rules could be collapsed under one that says when two vowels come together, the first totally assimilates in vowel quality to the second. However, the sequence /a + ɷ/ across a word boundary does not change (see sentence (3) in the text in chapter 7.). More investigation is needed, especially of boundary conditions.

5.2.5 Diphthongization of Long Mid Vowels

The long mid vowels /ee,ɛɛ,oo,ɔɔ/ are, besides the pure vowels, manifested as [ie,ɪɛ,ɪa,ɛa,uo,ɷa,ɷɔ]. In this section I show how these can be derived.

5.2.5.1 Front Long Mid Vowels

The long mid vowel /ee/ diphthongizes to [ie] optionally after non-coronal consonants. After coronal consonants, the process seems to be obligatory, as no examples of [Cee] have been found where C is a coronal consonant.

(38)	[gbèéŋ]	'a pot'	[gbìèké]	'the pot'
	[gèè]	'here'	[gìe]	'here'
	[béé]	'be (loc.)	[bíé]	'be (loc.)
			[zìé]	'to stand'
			[bìtíéŋ]	'chin'

A rule producing these forms would be:

(39) ee --> ie (optional)

In some words, [ɛɛ] alternates with [ɛa] and [ɩa]. The observed alternations are:

(40)	[léèŋ]	[líàŋ]	[léàŋ]	'ax'
	[kpééŋ]	[kpíáŋ]	[kpéáŋ]	'chicken'
	[dààgbéébɨŋ]	[dààgbíábɨŋ]	[dààgbéábɨŋ]	'wood bark'
	[kàlèŋgbéèŋ]	[kàlèŋgbíàŋ]	[kàlèŋgbéàŋ]	'mussel
	[bèègì]	[bìàgì]		'be able'

The first column is presumed to be the most basic. A rule that would produce the second column would be something like:

(41) ɛɛ --> ɩa (optional)

Then the output of this rule could feed the following rule which produces the data in column three above:

(42) High Vowel Lowering: (optional)

$$\begin{array}{lll} \text{V} & \text{--> [-high] / __} & \text{V} \\ \text{[+high]} & & \text{[-high]} \\ \text{[-back]} & & \text{[+low]} \end{array}$$

I posit that processes (39) and (41) are the same rule operating on different [ATR] sets.I claim that [ɩa] rather than [ɩɛ] is the counterpart to [ie]. There are four reasons for this. First, there is an [e/a] alternation in some affixes corresponding to [+/-ATR] (see 4.3.1.1). Thus [e] is, in at least some cases, the [+ATR] counterpart to [a]. Second, the process of /ɛ/ becoming [ɩa] or [ya] is common among related languages (Naden 1989:154), as is, analogically, also the case for /ɔ/ becoming [ʊa] or [wa] below. Third, there is a distributional restriction on [ɩɛ] as noted below. It is easy to derive [ɩɛ] from [ɩa], but not vice versa. Fourth, if we assume a symmetrical relationship between front and back vowel diphthongization, the fact that [ʊa] is common but not [ʊɔ] relates to the point that both [ɩa] and [ʊa] are the products of this diphthongization. So /ee, ɛɛ/ diphthongize to [ie,ɩa]:

(43) Front Long Mid Vowel Diphthongization: (optional except after coronals)

ee --> ie
ɛɛ --> ɩa

The sequence [ɩɛ] remains to be explained, if it is not the counterpart of [ie]. One fact that illumines the situation is that almost invariably, [ɩɛ] occurs preceding a syllable with [ɩ], e.g. [plèsí] 'to ask,' [flèlí] 'cool.' Rule (34), fronting [a] to [ɛ] in such a position has already been proposed to account for another set of data, and will be taken to apply here also. Sample derivations illustrating the above rules are given below. The rules must apply in the order shown. All rules below are optional, and non-application is marked by (-).

(44)	Underlying	/kpɛɛŋ/	/kpɛɛŋ/	/kpɛɛŋ/	/pɛɛsɩ/
	Diphth. (43)	-	kpɩaŋ	kpɩaŋ	pɩasɩ
	Lower (42)	-	-	kpɛaŋ	-
	Front (34)	-	-	-	pɩɛsɩ
	Surface form	[kpɛɛŋ]	[kpɩaŋ]	[kpɛaŋ]	[pɩɛsɩ]

The model above predicts the diverse pronunciation of the many forms which are attested (including [pɩasɩ]).

5.2.5.2 Back Long Mid Vowels

Long back mid vowels optionally diphthongize in a manner similar to the front mid vowels:

(45)	[bòòlúŋ]	'fire'	[b^{w}ɔ̀ɔ̌rá]	'sack'
	[góóřì]	'stop fighting'	[kɔ̀ɔ́ŋ]	'farm'
	[ɲúóŋ]	'chest'	[kɔ̀áŋ]	'farm'
	[dùóŋ]	'dawadawa tree'	[gbɔ̀yɔ̀áŋ]	'duck'

See also the data in chapter 3. The rule would be something like:

(46) Back Long Mid Vowel Diphthongization: (optional except after coronals)

oo --> uo
ɔɔ --> ɷa

Arguments that the two processes in (46) are actually one are similar to the arguments supporting (43). First, as previously mentioned, /ɔ/ becoming [ɷa] or [wa] is common in related languages. Second, the sequence [ɷɔ] is relatively rare and restricted to certain environments. Thus it is relatively simple to derive [ɷɔ] from [ɷa], but not the reverse. Also, there is an alternation [a/o] similar to the [a/e] case. [yɩ-wa] 'give him', [ye-wo] 'see him.'

The sequence [ɷɔ] is not common. One case is in [kɔ̀ɔ̀kɔ́] 'the farm.' (c.f. [kɔ̀áŋ] 'farm') This can be derived by a rule similar to A Fronting (34):

(47) A Rounding

$$\begin{bmatrix} V \\ +low \\ -round \end{bmatrix} \rightarrow [+round] \;/\; __\; C \begin{bmatrix} V \\ +high \\ +round \end{bmatrix}$$

For another example, see /wa/ --> [wɔ] in sentence 16 in chapter 7.

The dipthongization of both front and back long mid vowels is a unitary process, and so rules (43) and (46) can be combined:

(48) Long Mid Vowel Diphthongization (optional except after coronals)

ee --> ie
ɛɛ --> ɩa
oo --> uo
ɔɔ --> ʊa

5.2.6 Short Vowel Diphthongization

In several words, /ɔ/ is heard alternating between [ɔ] and [wa], e.g. [kɔ̀lɛ́]/[kwàlɛ́ʔ] 'penis.' (also see chapter 3, list 41, and items 31, 36, and 197 in Chapter 8.) The [kwa] differs from the [kʊa] discussed in 5.2.5.2 in length and tone-bearing ability. In [kʊa] the [ʊ] has full vowel quality and length, and its tone can be distinct from [a], while the [w] in [kwa] is short and never has a tone different than [a]. The environment in cases attested thus far is always after a [k]:

(49) Glide Formation

ɔ --> wa / k __

Whether /ɛ/ goes through an analogous process is unknown at present.

5.2.7 Raising of /a/

In some cases, /a/ raises to [ə]:

(50) [kálɩ́] 'sit!' [kə́lɩ́] 'sit!'
[báŋ] 'ten' [bə́ŋsɩ̀lɩ̀] 'twenty'

The conditions for this process are unclear at present, and need more investigation, especially with relation to (34) A Fronting.

5.2.8 Nasalization of Vowels

Though not indicated on data in Section 3, when a vowel precedes a nasal consonant, it is nasalized. When that nasal vowel deletes (as in Glottal Substitution above), the vowel remains nasalized.

(51) [dããŋ]/[dãã?] 'day' [dʒɩbɨ̃ŋ] 'knife'
[tɨ̃ŋ] 'town' [kõõŋ] 'hoe'

The rule is:

(52) Vowel Nasalization:

V --> [+nasal] / __ C
[+nasal]

5.3 Rule Summary and Ordering

5.3.1 List of Rules

(11) Labialization: (optional)

```
      C     ---> [+rd] /___    V
  [-cnt]                     [+rd]
  [-cor]
```

(13) Palatalization I: (optional)

```
       C    --> [+high] /__    V
   [+cor]                    [+high]
   [+str]                    [-back]
```

(14) Palatalization II: (optional)

```
          C     ---> [+high]      / __     V
     [+cor]         [+del rel]             [-back]
     [-cnt]                                [+high]
```

(16) Spirantization of g: (optional, within words)

```
      C      --> [+cnt] / V__V
  [-cnt]
  [+voi]
  [+back]
```

(18) D Flapping: (within words only)

```
      C     -->  [+cnt] / V__V
  [-cnt]
  [+voi]
  [+cor]
```

(20) D-Assimilation

$d \rightarrow C_i \ / \ C_i + __$

(23) Nasal Assimilation I (within words)

```
     C --> [αpt] /__    C          (note: N --> ŋ /__kp,gb)
[+nas]               [α pt]
```

(24) Nasal Assimilation II (across words)

```
     C --> [αpt] /__ #   C          (note: N --> ŋm /__kp,gb)
[+nas]                 [α pt]
```

(26) Glottal Substitution I: (optional)

$ŋ \rightarrow ? \ / \ __\#$

(28) Glottal Substitution II: (optional)

V --> ʔ / VCV__#

(30) Front Vowel Centralization:

$$\begin{matrix} V \\ [-bac] \end{matrix} \text{ --> [+back] / C } __ \begin{matrix} C \\ [+nas] \\ [+back] \end{matrix}$$

(32) Glide Agreement:

$$\begin{matrix} V \\ [+hi] \end{matrix} \text{ --> } \begin{matrix} [\alpha \text{ rd }] \\ [\beta \text{ bac}] \end{matrix} \text{ / } __ \begin{matrix} G \\ [\alpha \text{ rd }] \\ [\beta \text{ bac}] \end{matrix}$$

(34) A Fronting

$$\begin{matrix} V \\ [+low] \end{matrix} \text{ --> [-back] / } __ \text{ C } \begin{matrix} V \\ [-back] \end{matrix}$$

(35) Vowel Sandhi I

ɩ + ɷ --> ɷɷ

(37) Vowel Sandhi II

$$\begin{matrix} V \\ [-back] \end{matrix} \text{ \# a --> aa}$$

(42) High Vowel Lowering: (optional)

$$\begin{matrix} V \\ [+high] \\ [-back] \end{matrix} \text{ --> [-high] / } __ \begin{matrix} V \\ [-high] \\ [+low] \end{matrix}$$

(47) A Rounding

$$\begin{matrix} V \\ [+low] \\ [-round] \end{matrix} \text{ --> [+round] / } __ \text{ C } \begin{matrix} V \\ [+high] \\ [+round] \end{matrix}$$

(48) Long Mid Vowel Diphthongization (optional except after coronals)

ee --> ie
ɛɛ --> ɩa
oo --> uo
ɔɔ --> ɷa

(49) Glide Formation

ɔ --> wa / k __

(52) Vowel Nasalization:

$$V \rightarrow [+nasal] \; / \; __ \; \begin{matrix} C \\ [+nasal] \end{matrix}$$

5.3.2 Orderings

There are undoubtedly more restrictions on rule order than are listed here; these are some obvious ones.

(52) Vowel Nasalization before (26) Glottal Substitution I

In the variation [daaŋ]/[dãã?] 'day', the vowels must be nasalized before the final /ŋ/ deletes.

(23) Nasal Assimilation I before (30) Front V Centralization

In [sɨŋkpááŋ] 'groundnut,' the nasal must be specified as [ŋ] in order for the vowel to centralize.

(11) Labialization before (32) Glide Agreement

Consider the data [á kô] 'to be dry,' [kà k^{w}ɩyá] 'it has dried.' In the second case, the /k/ must labialize under the influence of the /ɷ/ before the /ɷ/ is itself changed to [ɩ].

(48) Long Mid Vowel Diphthongization before each of these:
(34) A Fronting
(42) High Vowel Lowering
(47) A Rounding

See derivations at the end of 5.2.5.1, and the example [kɷɔkɷ] before (47). (34), (42), and (47) are unordered with respect to each other.

6. TONE

6.1 INTRODUCTION

This is a preliminary study of Kɔnni tone. The main analysis is based on inserting approximately 230 nouns into four frames. Several verb aspects were also examined. The noun frames were designed to detect perturbations when the target noun was preceded by a low tone, preceded by a high tone, followed by a low tone, or followed by a high tone. As it turned out, the frame of low tone preceding the noun turned out to have a floating high associated with it (see (a) below, and Sec. 6.3.2), but the results were very useful in unanticipated ways.

The frames were: (a) ò (H) X 'his X'
(b) ŋ̀ wó X̧. 'I lack X.'
(c) X wón'ná 'This is a X.'
(d) X kàànɩ́ 'one X'

Since autosegmental phonology often gives insightful explanations for tonal phenomena, I have based my analysis here on this model. As in (a) above, a floating tone will be indicated by parentheses around that tone. More studies will be needed on the verbal system, compound nouns, and other constructions to give a more complete view of the tonal system of Kɔnni.

6.2 INVENTORY OF TONES, EVIDENCE OF CONTRAST

Kɔnni has three level tones of High, Low, and downstepped High. These can combine to form one rising (low to high) and two falling tones (high to low and high to downstepped high). In transcriptions below, downstep will be indicated by ' before the next High tone. These are illustrated below.

(53) [kpáą̀ŋ] 'oil' [dááŋ] 'akpeteshie drink'
[kpá'áŋ] 'guinea fowl' [dàáŋ] 'stick, wood'
[kpàáŋ] 'back of head'

Crucial to the autosegmental approach (and this study) is the view of a downstepped high being the result of a floating low tone between two high tones. So a phonetic sequence of H'H would have an underlying tone pattern of HLH.

Further evidence of contrast is in the frame data in 6.5.

6.3 PHONOTACTICS

6.3.1 Attested Tone Sequences

Attested sequences of tones on nouns are listed below. Instances where there are only one or two cases in my data are noted by (1) or (2). Besides H for High tone and L for Low, R is Rising tone, F is Falling (High to Low), and D is falling (High

to downstepped High). The attested surface or phonetic tones are as follows:

(54) Phonetic sequences of tones on nouns in frames:

One-syllable:	H, R, D
Two-syllable:	HH, HL (2), LH, LL (2), H!H, LD
Three-syllable:	HHH, HHF, HHL, HH!H, H!HH, HLL, LHH, LH!H, LLH
Four-syllable:	HHHH (1), HHH!H (1), H!HHH (1), LHLL, LLH!H
Five-syllable:	LLHLL

For underlying tones that give rise to the above, see 6.5. There is no HLH sequence phonetically, due to a High-Tone Spreading Rule (see 6.4.1). In addition, contour tones occur only on word-final syllables. Though low-toned monosyllabic nouns are unattested, there are several monosyllabic grammatical particles which have L tone, such as pronouns (fò 'you' (obj.)), conjunctions (à 'and'), and various affixes (nàn- future aspect).

There are never more than two tones per syllable in Kɔnni.

6.3.2 Tonal Morphemes

Autosegmental phonology allows and even predicts the existence of segmental morphemes that have no inherent tone, as well as morphemes which consist solely of tone. No unambiguous cases of toneless morphemes have been found yet, but several nonsegmental tonal morphemes are evident.

For example, a high rather than a low tone on a subject pronoun turns an indicative clause into a conditional one:

(55)	[ò gá hááglŋ]	'he's gone to bush'
	[ó gà hááglŋ...]	'if he goes to bush...'

At least some verb aspects have tonal melodies associated with the verb root, though with segmental material added as well:

(56) (a)	FUTURE nàn H	[ò nàŋ-gá]	'he will go'
		[ò nàm-bɔ́bí]	'he will tie'
		[ò nàm-pógílí]	'he will hold'
(b)	INFINITIVE á HL	[á gâ]	'to go'
		[á bɔ́bî]	'to tie'
		[á pógílî]	'to hold'
(c)	PERFECT L yá	[ò gà-yá]	'he has gone'
		[ò bɔ̀bì-yá]	'he has tied'
		[ò pɔ̀gìlì-yá]	'he has held'

Also, a floating high tone marks the associative construction for the third person possessive pronoun: 'his X.' (The examples below and in 6.5 are all the third person singular pronoun, but the same pattern holds for third person plural as

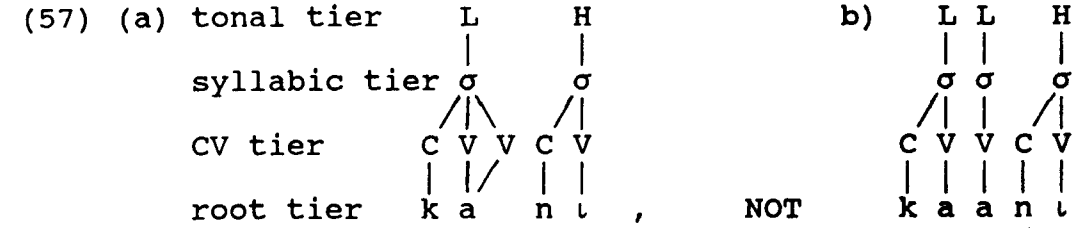
well, although not for the associative construction in general.) This floating tone is one which is not associated to any vowel underlyingly; it has an independent existence as a morpheme. It occurs between the pronoun and the possessed noun.

The presence of the floating tone can be deduced from its effects on the following word in constructions of the form 'his X.' For example, kagba 'hat' is seen to have the tone pattern LL in the example [kàgbà kàànɩ́] 'one hat.' However, a high tone is added in [ò kágbà] 'his hat.' (For the rule that associates the high tone to the following noun, see Sec. 6.4.3.)

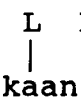
This analysis is supported by the fact that in the construction [ò̩ X] 'his X,' the X never has a low tone on its first syllable. The floating high tone always associates with this first syllable.

6.3.3 Tone, Long Vowels, and Tone-Bearing Units

It was noted above that Kɔnni tolerates a maximum of two tones per syllable or tone-bearing unit. This observation is evidence for the claim that long vowels consist of one tone-bearing unit, or one syllable. I propose that the long vowel in kaanɩ and other words has the following geometry:



This is because of the behavior of kaanɩ with respect to High Spread 1 rule, discussed below (see 6.4.1). The low tone acts as if it were a single tone with only one association line. The vowel is phonetically long. Therefore, I will use



as a shorthand representation for (a) above, and the L tone is to be regarded as being linked to the whole syllable kaa.

6.4 RULES

6.4.1 High Tone Spreading (I)

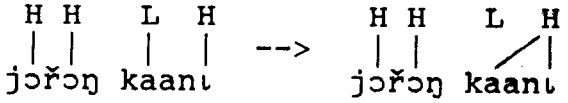
Note the different tone patterns on kaanɩ in the following:

(58) jɔ́ř́ɔ́ŋ !káánɪ́ vs. kàgbà kàànɪ́

'one ladder' 'one hat'

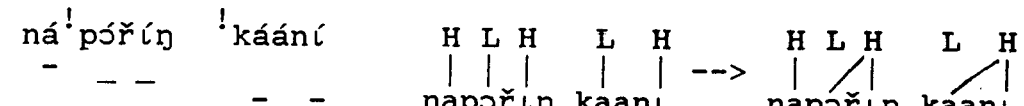
Within the word kaanɪ 'one' the basic tone is LH. Under the influence of the preceding H in jɔřɔŋ, the H in kaanɪ spreads left, delinking the L, thus:

(59)



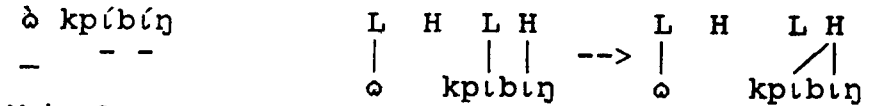
I assume this spreading also operates when all the relevant tones are within the same word. Note:

(60)



The high tone that triggers the spreading does not have to be linked to a vowel, as seen here:

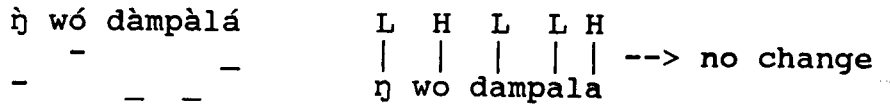
(61)



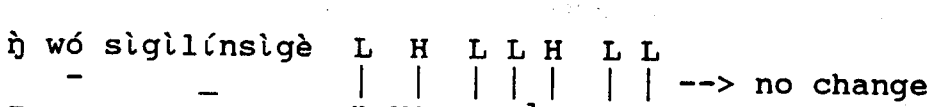
That kpɪbɪŋ is underlyingly LH is seen in its tones in [kpɪ̀bɪ́ŋ wɔ́n ná] 'this is a louse', and [kpɪ̀bɪ́ŋ !káánɪ́] 'one louse.'

The rightmost H can only spread when there is one and only one L betweeen it and the other H on the left. So while a sequence of HLH activates the rule, HLLH does not:

(62)

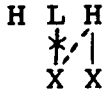


(63)



The rule needed to account for these examples is:

(64) High Spread 1 (HS1)



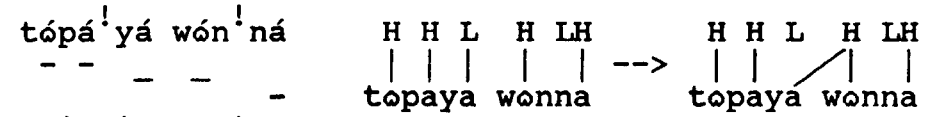
Note: the left H need not be associated.

Following the usual autosegmental conventions for rule notation, a crossed-out association line denotes deleting that line (delinking the tone, or setting it afloat), and a dotted line denotes forming that line.

6.4.2 High Tone Spreading (II)

A high tone also spreads left across a word boundary, delinking the low tone ending the preceding word. Thus:

(65) tópá!yá wón!ná



'this is a pill'

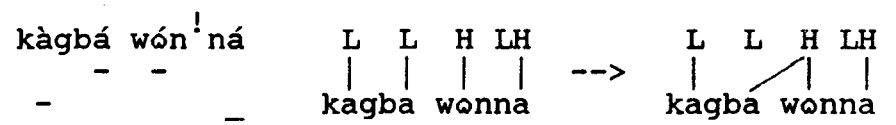
The high tone delinks the low tone of the long syllable in kařɛntɪa 'cutlass':

(66) kàřén!tɪá wón!ná

'this is a cutlass'

However, the high tone delinks only one low tone to the left in kagba 'hat':

(67) kàgbá wón!ná

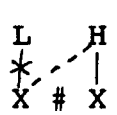


'this is a hat'

So the rule of High Spread 2 delinks one and only one L with all its associations.

High Spread 2 differs clearly from High Spread 1. Example (67) shows that H spreads to any L in the preceding word; a HLH sequence is not necessary. Also, HS2 applies only across word boundaries, while HS1 applies within words as well as across words. Tentatively, then, the rule is:

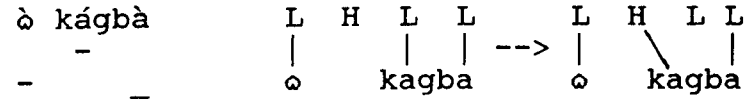
(68) High Spread 2 (HS2)



6.4.3 H Docking Right

A floating high tone will 'dock,' or become associated, to a vowel on its right, if the vowel is associated with a low tone. The low tone in turn is delinked or set afloat. (NOTE: The only data I have on this so far is from the associative construction, in particular, 'his X.') Thus:

(69) ò kágbà



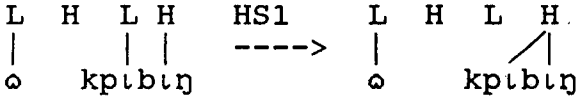
'his hat'

Why this particular floating high docks right rather than left is a matter for further investigation. It could be that in terms of lexical bracketing it is more closely bound to the right. The rule of High Tone Docking Right can be formulated as follows:

(70) High Tone Docking Right (HDR)

This docking process must be ordered after High Spread 1. When there is a configuration of tones in which both High Docking Right and High Spread 1 could take place, it is the High Spread 1 which occurs (bleeding HDR), as shown in (61) above, repeated here (also see ɷ gɷraaŋ in 6.5.2.9):

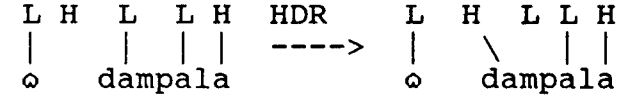
(71) ò kpíbíŋ



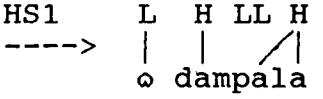
'his louse'

However, the order of these rules appears to reverse in some cases:

(72) ò dám!pálá



'his bench'



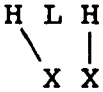
Here, High Spreading 1 cannot apply at first, since there are two low tones between highs (see (62)). But High Docking Right applies, and thus creates the environment for High

Spreading 1 to apply (I assume the floating L deletes automatically when adjacent to another L).

How do we explain the ordering paradox? There could be a cyclic phenomenon going on, or we could postulate that the rules apply whenever their structural description is met. The cyclic application could be the result of High Spreading 1 and High Docking Right being lexical rules which apply in that order, and High Spreading 1 also having a postlexical application. More investigation is needed to decide the point.

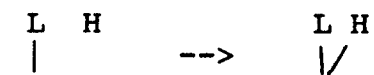
6.4.4 Tone Docking Left

In some Kɔnni words, we need to postulate more underlying tones than there are syllables. This is because of the existence of falling and rising tones word-finally, which require HL and LH tones, respectively, on the last syllable, as well as downstepped high tones word-finally, which require a H L H configuration:

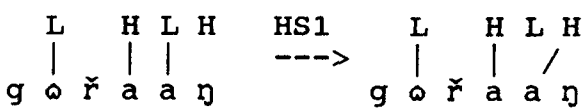


(73) (a) kǒřǒbâ

(b) tăŋ



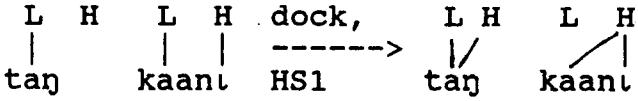
(c) gɔ̀řá!áŋ



'lizard'

To take care of (73a) and (73b), a rule is needed which docks a floating high or low tone at the end of a word onto the last syllable of that word. This rule alone does not delink a tone already associated with the final syllable:

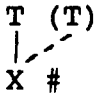
(74) tăŋ !káánɩ́



'one stone'

So we can write the rule of Tone-Docking Left as:

(75) Tone-Docking Left (TDL)



where T is any tone, and (T) is floating at the end of a word.

(This rule is prevented from being iterative by the prohibition in Kɔnni against having more than two tones associated to one syllable.)

However, a docking process that appears almost identical to the High-Spreading 1 rule occurs in (76c) and below:

(76) ŋ wó !táŋ

L H L H HS1 L H L H

ŋ wo taŋ ----> ŋ wo taŋ

'I lack stone'

I assume this actually is another case of High-Spread 1. The only difference in the process here and in (64) is that here the High tone that spreads is floating to start with. Therefore, I will re-write (64) as:

(77) High Spreading 1 (HS1 - revised)

H L H Note: either H may be floating.

X

If HS1 can apply, it will do so in preference to TDL, delinking the low tone. Only if HS1 cannot apply will TDL do so.

6.4.5 Extra Floating Low Tone

Both tasɪŋ 'headpan' and naagɪŋ 'cow' seem to require an underlying tone pattern of HLH, as seen by the downstepped high tone on the last syllable below:

(78) ŋ wó tá!síŋ

L H H L H HS1 L H H L H

ŋ wo tasɪŋ ----> ŋ wo tasɪŋ

(79) ŋ wó náá!gíŋ

L H H L H HS1 L H H L H

ŋ wo naagɪŋ ----> ŋ wo naagɪŋ

However, in another context, the behavior of the two words is quite different. In the expression tasɪŋ kaanɪ 'one headpan,' the High Spreading 1 rule works as expected, twice:

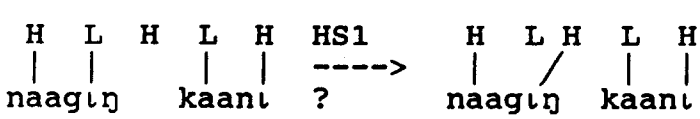
(80) tá!síŋ !káánɪ

H L H L H HS1 H L H L H

tasɪŋ kaanɪ -----> (twice) tasɪŋ kaanɪ

However, it only operates once in naagɪŋ kaanɪ, that is, kaanɪ retains its LH surface tone pattern:

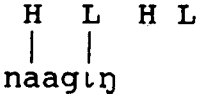
(81) náá!gíŋ kàànɩ́



Interestingly, there are several other sets of words which behave like naagɩŋ with respect to kaanɩ. These are the words represented by guřaaŋ, tanyeelɩŋ, kambɔntamɩŋ, and kalaŋgbɛɛŋ (see data in section 6.5). These all act as if they do not end in a high tone, which would provide the environment for HS1 to apply to kaanɩ.

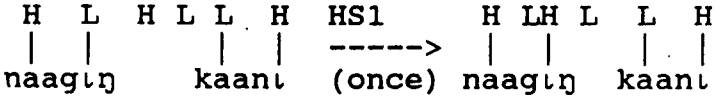
I propose that in fact these words do not end in a high tone, but a low, that is, they have an extra floating L tone at the end. So the representation of naagɩŋ, rather than as in (81) is actually:

(82)



The derivation for naagɩŋ kaanɩ is then:

(83) náá!gíŋ kàànɩ́



With a HLLH rather than HLH tonal configuration, the High-Spreading 1 rule cannot apply.

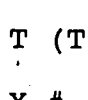
6.4.6 Summary of Rules and Orderings

(77) High Spreading 1 (HS1 - revised)

Note: neither H need be associated.

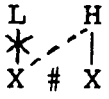
(70) High Tone Docking Right (HDR)

(75) Tone-Docking Left (TDL)



where T is any tone, and (T) is floating at the end of a word.

(68) High Spread 2 (HS2)



HS1 applies before HDR when both could apply, and bleeds it (see (71)). However, HDR can apply before HS1 and feed it (see (72)).

As the rules are written, if HS1 can apply, it will do so in preference to TDL, delinking the low tone. Only if HS1 cannot apply will TDL do so. An alternate possibility is TDL applies before HS1, and HS1 would need to be modified so the rightmost H that delinks the L may be associated to the same syllable as the L it delinks.

6.5 LIST OF DATA AND POSTULATED UNDERLYING TONES

Only one example is given of each tone class, but if there are fewer than five examples in my data, the number is marked.

6.5.1 One-Syllable Nouns

1.	sóŋ H	'broom'	sóŋ wón!ná ŋ wó sóŋ	sóŋ !káání à sóŋ
2.	tăŋ LH	'stone'	tăŋ wǫ́n!ná ŋ wó 'táŋ	tăŋ !káání à tá'ŋ́

6.5.2 Two-Syllable Nouns

1.	jóróŋ HH	'ladder'	jóróŋ wón!ná ŋ wó jóróŋ	jóróŋ !káání à jóróŋ
2.	hògó ?	'woman'	hògó wǫ́n!ná ŋ wó 'hógó	hògó !káání à hógô (à?)
3.	kpìbíŋ LH	'louse'	kpìbíŋ wón!ná ŋ wó 'kpíbíŋ	kpìbíŋ !káání à kpíbíŋ
4.	náá!gɨ́ŋ HLHL	'cow'	náá!gíŋ wǫ́n!ná ŋ wó náá'gíŋ	náá!gíŋ kàání à náá'gíŋ
5.	kàgbá LL (2 examples)	'hat'	kàgbá wón!ná ŋ wó kàgbà	kàgbà kàání à kágbà
6.	tá!sɨ́ŋ HLH (3 examples)	'headpan'	tá!síŋ wǫ́n!ná ŋ wó tá'síŋ	tá!síŋ !káání à tá'síŋ
7.	máásà HL (2 examples)	'a cake'	máá!sá wón!ná ŋ wó máásà	máásà kàání à máásà
8.	nìmbóà LHL (4 examples)	'sibling'	nìmbó!á wón!ná ŋ wó 'nímbóà	nìmbóà kàání à nímbóà
9.	gòřá!áŋ LHLHL (1 example)	'lizard'	gòřá!áŋ wǫ́n!ná ŋ wó 'góřá'áŋ	gòřá!áŋ kàání à góřá'áŋ

6.5.3 Three-Syllable Nouns

1.	wásígá HHH	'dry TZ'	wásígá wón!ná ŋ wó wásígá	wásígá !káání à wásígá
2.	bòřìmíŋ ?LH (2 examples)	'donkey'	bòřìmíŋ wón!ná ŋ wó 'bóřímíŋ	bòřìmíŋ !káání à bó'římíŋ
3.	dàmpàlá LLH	'bench'	dàmpàlá wó na ŋ wó dàmpàlá	dàmpàlá !káání à dám'pálá

4. kòkwábíŋ 'feather' kòkwábíŋ wón!ná kòkwábíŋ !káánì
LHH ŋ wó 'kókwábíŋ ò kókwábíŋ

5. dógátâ 'doctor' dógá!tá wón!ná dógátá kàànì
HHHL (3 examples) ŋ wó dógátâ ò dógátâ

6. ná!póríŋ 'calf' ná!póríŋ wón!ná ná!póríŋ !káánì
HLH (4 examples) ŋ wó ná'póríŋ ò ná'póríŋ

7. kóřóbâ 'pot' kóřó!bá wón!ná kóřóbà kàànì
HHHL (1 example) ŋ wó kóřóbâ ò kóřóbâ

8. lìgìří 'money' lìgìří wón!ná lìgìří !káánì
? (2 examples) ŋ wó 'lígíří ò lí'gíří

9. tányéé!líŋ 'ash' tányéé!líŋ wón!ná tányéé!líŋ kàànì
HHLHL (2 examples) ŋ wó tányéé'líŋ ò tányéé'líŋ

10. kálàŋgbé!éŋ 'mussel' kálàŋgbé!éŋ wón!ná
HHHLHL kálàŋgbé'éŋ kàànì
(1 example) ŋ wó kálàŋgbé'éŋ
ò kálàŋgbé'éŋ

11. kàřéntìà 'cutlass' kàřén!tíá wón!ná
LHLL kàřéntìà kàànì
(3 examples) ŋ wó 'kářéntìà
ò kářéntìe

6.5.4 Four-Syllable Nouns

1. àlìbélsà 'onion' àlìbél!sá wónna
LLHL àlìbélsà kàànì
ŋ wó àlìbélsà
ò á'líbélsà

2. kàmbòntá!míŋ 'pawpaw' kàmbòntá!míŋ wónna
LLHLHL (lit. kàmbòntá'míŋ kàànì
(1 example) 'Ashanti ŋ wó kàmbòntá'míŋ
sheanut') ò kám'bóntá'míŋ

6.5.5 Five-Syllable Nouns

1. sìgìlínsìgè 'hiccups' sìgìlín!sígé wón!ná
LLHLL sìgìlínsìgè kàànì
ŋ wó sìgìlínsìgè
ò sígílínsìgè

COLLECTED LANGUAGE NOTES

No. 20

A PRELIMINARY PHONOLOGY OF THE KƆNNI LANGUAGE

Michael Cahill

Ghana Institute of Linguistics, Literacy, and Bible Translation

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